

Light numerical test

1. The convex lens of focal length 50 cm and concave lens of focal length 25 cm put together. What is the power of combination? 3
2. Prove that object distance and image distance is equal for the plane mirror. 2
3. Draw the ray diagram. 4

Concave mirror is used in torch

Convex lens is used in magnifying glass

4. $n_{ga} = 1/n_{ag}$ 1
5. An object 5 cm in length is held 25cm away from a converging lens of focal length 10cm. find the position, size, nature of the image formed. Also draw the ray diagram. 3
6. A 2.5 cm candle is placed 12 cm away from a convex mirror of focal length 30 cm. give the location of the image and the magnification. 2
7. An arrow 2.5 cm high is placed at a distance of 25 cm from a diverging mirror of focal length 20 cm. find the nature, position and size of the image formed. Draw the ray diagram 3
8. An object 2 cm high is placed at a distance of 16 cm from a concave mirror, which produces 3 cm high inverted image. what is the focal length? also find the position of the image. 2
9. Find the speed of light in glass when the refractive index of glass is 1.5 w.r.t air. 1
10. When an object is placed at a distance of 60 cm from a convex mirror, the magnification produced is $\frac{1}{2}$. Where should the object be placed to get a magnification of $\frac{1}{3}$? 3
11. A convex lens has focal length of 20cm. calculate at what distance from the lens should the object be placed so that the image is formed at 40 cm on the other side of the lens? Also find magnification.

12. A 4 cm tall object is placed perpendicular to the principal axis of a convex lens of 20 cm. if the distance of the object is 30 cm from the lens, find position, nature and size of the image. Also find the magnification.
13. A concave mirror produces three times enlarged image which is virtual and erect. Then find the focal length and radius of curvature. $U=10\text{cm}$
14. An object 4 cm tall is placed on the principal axis of a concave mirror of focal length 20cm at a distance of 30 cm from it. Find the position, nature and size of the image.
15. An object of 5 cm in size is placed at a distance of 20 cm from a concave mirror of focal length 15 cm. at what distance from the mirror should a screen be placed to get the sharp image. Calculate size of the image too.
16. Draw a ray diagram of a concave mirror which is used by doctor's head mirror.
17. Draw the ray diagram when an object is kept at 2F in front of a concave mirror.
18. An object 4 cm in size is placed at a distance of 25cm from a concave mirror of focal length 15 cm. find the position, nature and height of the image.
19. An erect image of 3 times the size of the object is obtained with a concave mirror of radius of curvature of 36cm. what is the position of the object?
20. The image formed by a convex mirror of focal length 30 cm is a quarter of the object. What is the distance of the object from the mirror?
21. An object is placed 18 cm in front of a spherical mirror. The image is formed at 4 cm to the right of the mirror. Calculate the focal length. The mirror is concave or convex?
22. If $\sin i$ is 30 degree and $\sin r$ is 60 degree then find the refractive index.
23. When the RI of water is 1.33 and diamond is 2.42 then find the RI of diamond w.r.t water.
24. If the RI of diamond is 2.42 then what is the speed of light in diamond?

25. If two concave and two convex mirrors are placed together having powers respectively $2D, 3D, 1D, 2D$ then find the total power.
26. If the power is $5D$ then find the focal length of a concave lens.
27. If the focal length of a diverging lens is -3cm then find the power of the lens.
28. Focal length of a converging mirror is 50cm . what is R ?
29. What is the focal length of a plane mirror?
30. An object is placed at a large distance in front of a convex mirror of radius of curvature 40 cm . how far is the image formed behind the mirror?